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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JENS KLEFFMAN, KLAUS PETERS, and THOMAS BUCHINGER-BARNSTORF[1]

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Appeal 2015-000660
Application 12/842,235
Technology Center 1700

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Before CHUNG K. PAK, PETER F. KRATZ, and CHRISTOPHER L. OGDEN, *Administrative Patent Judges.*

PAK, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134(a) from the Examiner's decision[2] finally rejecting claims 1, 3–19, and 21–23, which are all of the claims pending in the above-identified application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] Appellants identify the real party in interest as "Continental Reifen Deutschland Gmbh of Hannover, Germany, a subsidiary of Continental Aktiengesellschaft of Hannover, Germany." Appeal Brief filed May 21, 2014 ("App. Br.") at 1.

[2] Final Action entered March 12, 2014 ("Final Act.") at 3–14; the Examiner's Answer entered August 14, 2014 ("Ans.") at 1–8.

## STATEMENT OF THE CASE

The subject matter on appeal is directed to "a pneumatic vehicle tire for heavy duty, commercial utility vehicles" which "has a tread with at least two circumferential grooves" running in the circumferential direction and dividing the tread into circumferential ribs. Spec. ¶ 2. Figure 1, which illustrates a partial perspective view of such pneumatic vehicle tire, is reproduced below:

Fig. 1

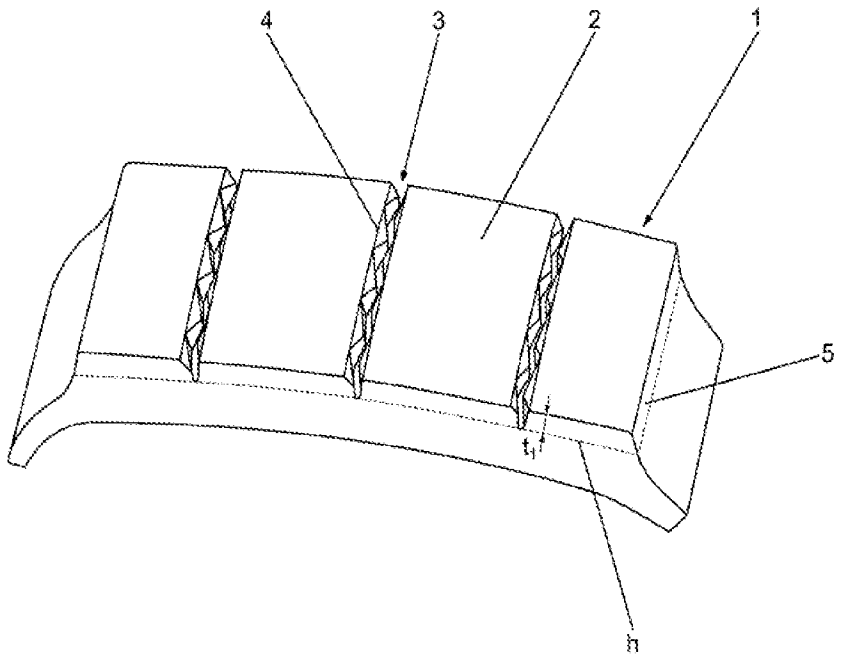


Figure 1 shows a tread 1 having four circumferential ribs 2 which are separated from one another by circumferential grooves 3 having peripheral edges 4 running around in the circumferential direction. Spec. ¶ 36. The maximum depth $t_1$ of the circumferential grooves 3 is between 10 mm and 25 mm. *Id.* The width of the circumferential grooves 3 is between 5 mm and 20 mm. *Id.* These circumferential grooves 3 may be running in a zigzag form. Spec. ¶ 38. "The envelope symbolized by the auxiliary line h, the periphery of the tread and the flank portions

5 at the shoulders of the tread 1 enclose a gross volume V . . . ." Spec. ¶ 37. "The groove volume $V_R$ . . . is the sum of the 'air volumes' of all the wide circumferential grooves 3 – determined between the groove boundaries and an envelope of the periphery of the tread." *Id.* "[T]he proportion of the groove volume $V_R$ in relation to the gross volume V is between 1% and 10%, preferably at most 7%, and in particular between 1% and 4%." *Id.* According to paragraph 2 of the Specification,

> [a] gross tread volume is defined by an envelope running in the tread parallel to the periphery of the tread and touching the lowest circumferential groove(s) from the inside radially, together with the periphery of the tread and flank portions at the shoulders. A groove volume is defined by all the grooves in the tread.

Details of the appealed subject matter are recited in illustrative claim 1, which is reproduced below from the Claims Appendix of the Appeal Brief (with disputed limitations in italicized form):

> 1. A pneumatic vehicle tire for a commercial utility vehicle, comprising:
>
> a tread formed with at least two circumferential grooves running in a circumferential direction of the tire and dividing said tread into circumferential ribs, said tread having an outer periphery and, adjacent said periphery and on either side thereof, shoulders with flank portions;
>
> said tread having a gross tread volume defined between:
>
> an outer envelope located on a surface area of said tread and traversing all of said grooves formed in said tread; and
>
> an inner envelope running parallel to said outer envelope inside said tread and touching a radially inner end of a deepest said circumferential groove and extending to said flank portions;
>
> a volume of all of said grooves formed in said tread together defining a groove volume; and

*said groove volume in said tread amounting to between 1% and 7% of said gross tread volume.*

App. Br. 13, Claims Appendix.

The Examiner maintains, and Appellants request review of, the following grounds[3] of rejection:

1. Claims 1, 5–7, 15, and 18 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Riches (US 3,556,190 issued Jan. 19, 1971),

[3] With respect to Rejections 1, 2, 5, and 6, Appellants only focus on claim 1 and do not present any separate arguments against the other rejected claims. App. Br. 4–12. Therefore, for at least those four rejections on this appeal, we limit our discussion to claim 1. 37 C.F.R. § 41.37(c)(1)(iv) (2012).

Ravenhall (US 3,534,798 issued Oct. 20, 1970), Campbell (US 2,756,797 issued Jul. 31, 1956), and Overman (US 2,265,543 issued Dec. 9, 1941);

2. Claims 1, 6, and 18 under 35 U.S.C. § 103(a) as unpatentable over the disclosure of Matsuda (US 4,884, 606 issued Dec. 5, 1989);

3. Claim 4 under 35 U.S.C. §103(a) as unpatentable over the combined disclosures of Matsuda and Campana (US 5,795,415 issued Aug. 18, 1998);

4. Claims 3, 4, and 10–14 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Matsuda and Buchinger[4] (DE 10 2007 016 929 A1 published Oct. 9, 2008);

5. Claims 1, 3, 6, 18, and 21–23 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Overman and Ravenhall;

6. Claims 1, 3–8, and 21–23 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, and Adam (US 5,211,781 issued May 18, 1993);

7. Claims 9 and 16 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, and Takigawa (US 4,332,286 issued Jun. 1, 1982);

8. Claim 17 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, Takigawa, and Tread Design Guide (Tread Design Guide, Bennet Garfield Publication (1968)); and

9. Claims 9, 15–17, and 19 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, and Suzuki (US 2007/0284026 A1 published Dec. 13, 2007). Final Act. 3–14; App. Br. 4–5.

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[4] The Examiner's reference to DE 10 2007 016 929 A1 (Buchinger) is to the machine English translation of record.

## DISCUSSION

Upon consideration of the evidence relied upon by the Examiner and Appellants in light of each of Appellants' contentions, we find that Appellants have not adequately explained or identified reversible error in the Examiner's determination that the applied prior art would have rendered the subject matter recited in claims 1, 3–19, and 21–23 obvious within the meaning of 35 U.S.C. § 103(a). 35 C.F.R. § 41.37(c)(1)(iv) (2012); *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (explaining that even if the examiner had failed to make a prima facie case, the Board would not have erred in framing the issue as one of reversible error because it has long been the Board's practice to require an appellant to identify or adequately explain the alleged error in the examiner's rejections). Accordingly, we sustain the Examiner's § 103(a) rejections of the above claims substantially for the reasons set forth in the Final Action and the Answer. We add the following primarily for emphasis and completeness.

### 1. Claims 1, 5–7, 15, and 18 under 35 U.S.C. § 103(a) based on Riches, Ravenhall, Campbell, and Overman

Appellants do not dispute the Examiner's finding that Riches discloses a 9×20 tire having a tread with a plurality of circumferential grooves 1 (e.g., zig-zag grooves) fifty-thousands of an inch wide (1.27 mm wide) and approximately half an inch deep (13 mm deep) running in a circumferential direction and dividing the tread into circumferential ribs 2. *Compare* Final Act. 3, *with* App. Br. 8–9; *see also* Riches, col. 1, l. 59– col. 2, l. 35. Nor do Appellants dispute the Examiner's finding that Riches' 9×20 tire, as explained by Ravenhall, has a tread width of 6.72 inches (171 mm) and Riches' 9×20 tire having such tread width has a groove volume of 1.4% of the gross tread volume per each circumferential zig-zag groove

in the tread. *Compare* Final Act. 3, *with* App. Br. 8–9[5]; *see also* Ravenhall, col. 1, ll. 53–57 and col. 2, ll. 10–15.

Although the Examiner acknowledges that Riches illustrates 6 circumferential grooves in the tread of its tire corresponding to the groove volume of about 8.4% of the gross tread volume (1.4% × 6 grooves = 8.4%), the Examiner finds, and Appellants do not dispute, that Riches' disclosure "is not limited to a tire having only 6 grooves" and includes a tire having a plurality of grooves which are also inclusive of 2 to 5 grooves. *Compare* Final Act. 3–4, *with* App. Br. 8–9. The Examiner also finds, and Appellants do not dispute, that "Overman and Campbell both teach that one can vary the number of ribs/grooves in a tread according[ly] based on the purpose of the tire (Overman, pg 1, left col, lines 7–15; Campbell, col 2, lines 20–25)." *Compare* Final Act. 4, *with* App. Br. 8–9.

Under these circumstances, we find no reversible error in the Examiner's determination that one of ordinary skill in the art would have had an apparent reason to use 2 to 5 circumferential grooves (those corresponding to the recited groove volume percentage based on the gross tread volume) in the tread of Riches' tire, with a reasonable expectation of successfully obtaining a tire having good drainage in worn and unworn conditions and a low rate of tread wear. *See, e.g.*, Riches, col. 1, ll. 50–58.

Appellants first contend that the Examiner's § 103(a) rejection is based on an arbitrary combination of individual element from four prior art references. App. Br. 8. However, Appellants do not explain why the combination of the teachings discussed *supra* is arbitrary. App. Br. 8–9. A close examination of the Examiner's § 103(a) rejection shows that Riches, as explained by Ravenhall, teaches or would

[5] Appellants do not show, much less argue, that the Examiner's calculation of the groove volume is incorrect. App. Br. 8–9.

have suggested all of the recited features—including the number of circumferential grooves corresponding, in total tread groove volume percentage, to the recited groove volume percentage based on the gross tread volume—as being suitable for forming its tire having good drainage in worn and unworn conditions and a low rate of tread wear. Moreover, the Examiner finds, and Appellants do not dispute, that Overman and Campbell also teach that the number of ribs/grooves used is a result effective variable. i.e., affects the purpose of tire. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1297 (Fed. Cir. 2012) ("A recognition in the prior art that a property is affected by the variable is sufficient to find the variable result-effective."); *In re Boesch*, 617 F.2d 272, 276 (CCPA 1980)("[D]iscovery of an optimum value of a result effective variable . . . is ordinarily within the skill of the art.")

Appellants also appear to contend that the applied prior art references are not combinable because they do not discusses Appellants' "main object of this invention: to effectively lower the rolling resistance." App. Br. 9. However, Riches and Overman, like Appellants, are also concerned with "the abrasion and life expectancy of the tire" or "a high degree long wear." *Compare* App. Br. 7, *with* Riches, col. 1, ll. 50–58 and Overman, col. 1, ll. 16–18. Moreover, "motivation [or reason] to modify a prior art reference to arrive at the claimed invention need not be the same motivation that the patentee had." *Alcon Research, Ltd. v Apotex Inc.*, 687 F.3d 1362, 1368 (Fed. Cir. 2012) (citing *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406, 420 (2007) (stating that it is error to look "only to the problem the patentee was trying to solve")). "As long as some [reason,] motivation or suggestion to combine the references is provided by the prior art taken as a whole, the law does not require that the reference be combined for the

reasons contemplated by the inventor." *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992).

Finally, Appellants do not argue that the claimed invention unexpectedly lowers the rolling resistance relative to the closest prior art, Riches. App. Br. 8–9. Nor do Appellants proffer a comparison between the claimed invention and the closest prior art to demonstrate that the claimed invention imparts unexpected results relative to the closest prior art. *Id.*; *see also In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973) (to show unexpected results, applicant must establish: "(1) that there actually is a difference between the results obtained through the claimed invention and those of the [closest] prior art, . . . and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of invention") (citation omitted); *In re Baxter Travenol Labs*, 952 F.2d 388, 392 (Fed. Cir. 1991) ("[R]esult must be shown to be unexpected compared with the closest prior art.")

Accordingly, we affirm the Examiner's decision rejecting claims 1, 5–7, 15, and 18 under 35 U.S.C. §103(a) as unpatentable over the combined disclosures of Riches, Ravenhall, Campbell, and Overman.

2. Claims 1, 6, and 18 under 35 U.S.C. §103(a) based on Matsuda

Appellants do not question that "Matsuda teaches a pneumatic tire comprising two [straight or zig-zag] circumferential grooves which divide the tread into ribs (see Fig. 1)." *Compare* Final Act. 5, *with* App. Br. 9–10. Nor do Appellants question that Matsuda's tread has the recited gross tread volume, outer periphery, and shoulders with a flank portions. *Compare* Final Act. 5–6, *with* App. Br. 9–10.

Thus, the dispositive question raised here is this: Would Matsuda have suggested the groove volume in the tread amounting to between 1% and 7% of the gross tread volume within the meaning of 35 U.S.C. §103(a)? On this record, we answer this question in the affirmative.

As acknowledged by Appellants, Matsuda teaches that "the width of the circumferential groove is about 3 to 8% of the tread width as measured between the opposed groove walls in a direction perpendicular to the groove wall[s]."[6] App. Br. 9 citing Matsuda, col. 3, ll. 8–11. The Examiner takes official notice, and Appellants do not challenge, that "[g]roove width is conventionally measured at the groove opening/tread surface." *Compare* Ans. 4, *with* App. Br. 9–10.[7] Nor do Appellants question the Examiner's finding that "it is common sense that the width is measured perpendicular to the groove walls [perpendicular to the circumferential groove] in the groove extension [widening] direction." *Compare* Ans. 4, *with* App. Br. 9–10.[8] Nor do Appellants question the Examiner's finding that "Fig. 1a [of Matsuda] illustrates the circumferential grooves as having a bottom with reduced width (about half the top width in Fig. 1a)." *Compare* Final Act. 5, *with* App. Br. 9–10. In other word, there is no dispute that Matsuda teaches each circumferential groove having a groove volume somewhere between 3% and 1.5% to somewhere

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[6] The article "the" in reference to "groove wall" refers to the earlier mentioned opposed groove walls defining the circumferential groove. Moreover, the term "width" of the circumferential groove indicates the spaced distance between the two opposing groove walls in a widening direction perpendicular to the opposing groove walls (circumferential groove running in a circumferential direction).
[7] No Reply Brief was filed in response to the Examiner's official notice that "[g]roove width is conventionally measured at the groove opening/tread surface."
[8] No Reply Brief was filed in response to the Examiner's finding that "it is common sense that the width is measured perpendicular to the groove walls [perpendicular to the circumferential groove] in the groove extension [widening] direction."

between 8% and 4% of the gross tread volume (when the width of the circumferential groove is about 3% to 8% as measured at the groove opening/tread surface, the width of the circumferential groove below the groove opening, including the bottom, of the groove is below 3% or below 8% because the bottom has a reduced width).[9] According to column 1, lines 10–16 and column 2, lines 25–30, of Matsuda, "at least two circumferential grooves having such characteristics can contribute to improve wet performance of the tire."

Under these circumstances, we find no reversible error in the Examiner's determination that Matsuda would have led one of ordinary skill in the art to form a tire having two circumferential grooves with each having a groove volume somewhere between 3% and 1.5% to somewhere between 8% and 4% of the gross tread volume, inclusive of the total groove volume of approximately 6% of the gross tread volume, as recited in claim 1, with a reasonable expectation of successfully improving the tire's wet performance. *See In re Peterson*, 315 F.3d 1325, 1329–30 (Fed. Cir. 2003) ("In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness.")

On this record, Appellants do not argue that the claimed invention imparts unexpected results relative to the closest prior art. App. Br. 9–10. Nor do

[9] Even were we to adopt the literal meaning of the language used in Matsuda, without limiting it to illustrative Figure 1a, we find that Matsuda broadly teaches the spacing distance between the groove walls defining a circumferential groove (the width of the circumferential groove from the opening on the surface to the bottom) constitutes anywhere from 3 to 8% of the tread width. In other words, Matsuda teaches that a circumferential groove having a groove volume from 3% to 8% of the gross tread volume as being suitable for its tire having improved wet performance.

Appellants proffer factual evidence to demonstrate that the claimed invention imparts unexpected results relative to the closest prior art. *Id.*

Accordingly, we affirm the Examiner's decision rejecting claims 1, 6, and 18 under 35 U.S.C. § 103(a) as unpatentable over the disclosure of Matsuda.

3. Claim 4 under 35 U.S.C. § 103(a) based on Matsuda and Campana

Appellants repeat the same argument that Matsuda does not teach or suggest using a tire having a "groove volume in said tread amounting to between 1% and 7% of said gross tread volume" as recited in claim 1. App. Br. 10. Appellants also argue that Campana does not remedy such deficiency in Matsuda. *Id.* However, as indicated *supra*, we find no reversible error in the Examiner's determination that Matsuda would have led one of ordinary skill in the art to form a tire having two circumferential grooves with each having a groove volume somewhere between 3% and 1.5% to somewhere between 8% and 4% of the gross tread volume, inclusive of the total groove volume of approximately 6% of the gross tread volume, as recited in claim 1, with a reasonable expectation of successfully improving the tire's wet performance.

Accordingly, we affirm the Examiner's decision rejecting claim 4 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Matsuda and Campana.

4. Claims 3, 4, and 10–14 under 35 U.S.C. § 103(a) based on Matsuda and Buchinger

The Examiner relies upon the same disclosure of Matsuda discussed above. The Examiner acknowledges that Matsuda does not specifically discuss the

specific dimension of its circumferential groove or a groove having projecting pyramidal portions. Final Act. 7.

However, the Examiner finds, and Appellants do not dispute, that "Buchinger, directed towards a tire with circumferential grooves, teaches grooves having a widths of 10-20 mm and a depth of 8-30 mm ([0017]) wherein the grove flanks are provided with a plurality of pyramidal projections ([0006-0007]) for the purpose of increasing profile durability, reducing resonance, and improving stone ejection ([0007-0008])." *Compare* Final Act. 7 with App. Br. 10; *compare also* Buchinger ¶¶ 7–8, *with* Spec. ¶¶ 36–38. The Examiner further finds, and Appellants do not dispute, that "Buchinger teaches that the pyramidal portions can occupy a substantial portion of the groove volume (the base can be 25% of the groove opening and the tip height can be up to 80% of the tread depth PT([0017, 0020])." *Compare* Final Act. 7–8, *with* App. Br. 10; *compare also* Buchinger ¶¶ 17 and 20, *with* Spec. ¶¶ 38 and 41. In fact, Buchinger illustrates circumferential grooves having the same designs as those illustrated in Appellants' drawing. *Compare* Buchinger Figs. 1–4, *with* Appellants' Figs. 1–4.[10]

Based on these fact findings, the Examiner concludes that the collective teachings of Matsuda and Buchinger would have led one of ordinary skill in the art to form the circumferential grooves taught by Buchinger in Matsuda's tire having a groove volume of approximately 6%, with a reasonable expectation of successfully increasing profile durability, reducing resonance, and improving stone ejection.

[10] In the event of further prosecution, the Examiner is advised to obtain the full, non-machine, English translation of Buchinger to determine whether it alone, or together with other prior art, would have rendered the claimed subject matter obvious within the meaning of 35 U.S.C. §103(a).

Rather than focusing on the teachings of Buchinger or on the combined teachings of Matsuda and Buchinger, Appellants repeat the same arguments that Matsuda does not teach or suggest "a groove volume of 1% to 7%, as claimed, nor any considerations dealing with the reduction of the rolling resistance." App. Br. 10. Thus, based on the same reasons stated *supra*, we do not find Appellants' argument persuasive of reversible error in the Examiner's § 103(a) rejection of claims 3, 4, and 10–14 as unpatentable over the collective teachings of Matsuda and Buchinger.

Accordingly, we affirm the Examiner's decision rejecting claims 3, 4, and 10–14 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Matsuda and Buchinger.

5. Claims 1, 3, 6, 8, and 21–23 under 35 U.S.C. § 103(a) based on Overman and Ravenhall

Appellants do not dispute the Examiner's finding that

> Overman discloses . . . a tire having a plurality of circumferentially extending ribs divided by circumferential grooves 10 having an opening width of 6/32 of an inch (4.8 mm) and filled with a protuberance of 5/32 of an inch width and leaving a 1/32 inch spacing (0.8 mm) (pg 2, lines 13-27). Overman further teaches in [the] embodiment of Fig. 3 and 4, the use of web members 12 which further fill the groove cavity (pg 2, lines 35-45). Regarding the volume of the grooves, Fig. 4 shows the webbing as occupying about half the depth of the groove, assuming a groove depth D, an opening width of 6/32in (4.8mm), and a web member 12 with a height of D/2 and a spacing of about 1/32 inch (0.8mm) on each side, the groove volume of each groove would be about (C is tread circumference):
>
> [4.8mm * D/2 + 0.8mm *2 * D/2] * C = 3.2 mm * D * C
>
> This [calculation] ignores the protuberance which occupies even greater groove volume than the web member—thus the groove volume is less than 3.2 mm *D *C."

*Compare* Final Act. 8, *with* App. Br. 11. Nor do Appellants dispute the Examiner's finding that Ravenhall teaches a conventional vehicle tire (11–20 inch tire) as having a tread width of 7.65 inches (about 194 mm). *Compare* Final Act. 8–9, *with* App. Br. 11; Ravenhall, col. 2, ll. 10–20. Nor do Appellants dispute the Examiner's finding that

> applying the groove of Overman to a tire of such size would result in each groove occupying a volume of less than 1.6% of the gross tread volume (3.2 mm*D*C /194 mm*D*C). With six grooves, the total groove volume would be about 9.6%; however, Overman states that the number and size of the ribs and grooves can be substantially varied (pg 1, right col, lines 7-15). Configuring the tire [tread] with 2-4 grooves would result in volumes of less than 7% or less than 4%.

*Compare* Final Act. 9, *with* App. Br. 11.

Appellants contend that one of ordinary skill in the art would not have been led to employ the grooves of Overman to the conventional vehicle tire having a tread width of 194 mm taught by Ravenhall. App. Br. 11. Appellants also contend that Ravenhall "teaches away from the modification proffered by the Examiner." *Id.* We are not persuaded by these contentions.

As correctly found by the Examiner, "Overman teaches width, depth and shape for circumferential grooves" to configure its tread design. Final Act. 18; *see also* Overman, p. 2, left col., ll. 13–46. The tread designed with such circumferential grooves, according to page 1, left col., lines 1–54, of Overman, provides a tire with a high degree of long wear, good traction, and resistance to skidding. The tire referred to by Overman is inclusive of the conventional vehicle tire having a tread width of 194 mm taught by Ravenhall. Overman, p. 1, left col., ll. 1–30.

As also correctly found by the Examiner, Ravenhall does not teach away from using Overman's advantageous tread design configured with circumferential grooves having the width, depth, and shape taught by Overman. Final Act. 18. Ravenhall, like Overman, discloses using ribbed tread designs on its conventional tires with their corresponding tread widths. *Id.* Although Ravenhall mentions these conventional tires have ribbed tread designs formed with circumferential grooves having a particular width and a bulbous base as argued by Appellants, the Examiner takes the official notice, and Appellants do not challenge, that "[t]hese [conventional] tires are commonly used for [sic., with] a variety of tread patterns and are not specific to the groove and groove width of Ravenhall." *Compare* Final Act. 18, *with* App. Br. 11. On this record, Appellants do not point to any teaching in Ravenhall, which criticizes, discredits, or otherwise discourages using the advantageous tire tread design having the recited circumferential grooves taught by Overman in conventional tires. App. Br. 11; *see also DyStar Textilfarben Gmbh & Co. Deutschland KG v. C.H. Patrick Col.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006) ("We will not read into a reference a teaching away from a process where no such language exists."); *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) ("The prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed in the . . . application.").

Under these circumstances, we find no reversible error in the Examiner's determination that the collective teachings of Overman and Ravenhall would have led one of ordinary skill in the art to employ the circumferential grooves taught by Overman to form an advantageous tread design on the conventional vehicle tire having a tread width of 194 mm taught by Ravenhall to arrive at the claimed tire,

with a reasonable expectation of successfully improving long wear, traction, and resistance to skidding.

Accordingly, we affirm the Examiner's decision rejecting claims 1, 3, 6, 18, and 21–23 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Overman and Ravenhall.

6. Claims 1, 3–8, and 21–23 under 35 U.S.C. § 103(a) based on Campbell, Campana, and Adam

Appellants do not dispute the Examiner's finding that

> Campbell discloses a plurality of circumferential grooves dividing a tread into a plurality of ribs. Campbell does not disclose the total groove volume of the grooves. Campana, directed towards pneumatic tires having treads with a ribbed pattern defined by a plurality of circumferential grooves, teaches that circumferential grooves can have widths of 2 to 15 mm and depths of 11 -18 mm (col 4, lines 50-57). As for the tread volume, ribbed tread patterns are conventionally used in heavy load/truck tires which typically have tread widths of about 200 mm or more. For example, Campana teaches a tire size of 315/80R22.5" (col 4, lines 45-49) which Adam teaches has a tread width of about 240 mm (col 4, lines 24-25). It is also noted that Campbell states that while five ribs are shown, it is understood that a tread pattern can be formed with any number of tread ribs (col 2, lines 20-27).

*Compare* Final Act. 11, *with* App. Br. 12. Rather, Appellants contend that

> Campbell describes a tire tread with a plurality of circumferential grooves having improved resistance to groove cracking due to a special design of the side walls of the grooves. Concerning Campana we refer to the above explanations. Adam is not pertinent with regard to the claimed invention.

App. Br. 11. However, Appellants' mere reference to Campbell's purpose, their agreement with the Examiner's finding relating to Campana,[11] and a broad unexplained conclusory statement relating to relevance of Adam to the claimed invention[12] does not explain reversible error in the Examiner's § 103(a) rejection based on the collective teachings of Campbell, Campana, and Adam. As stated by our reviewing court in *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). "[n]on-Obviousness cannot be established by attacking reference individually where the rejection is based upon the teachings of a combination of references." *See also In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("[T]he test [for obviousness] is what the combined teachings of the references would have suggested to those of ordinary skill in the art.").

Under these circumstances, we find no reversible error in the Examiner's determination that the collective teachings of Campbell, Campana, and Adam would have led one of ordinary skill in the art to employ at least two circumferential grooves suggested by Campbell and Campana on Campana's tire having a size of 315/80R22.5, which according to Adam, has a tread width of about 240 mm, to arrive at a tire having the recited groove volume.

Accordingly, we affirm the Examiner's decision rejecting claims 1, 3–8, and 21–23 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, and Adam.

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[11] According to page 10 of the Appeal Brief, "Campana merely discloses a tread for a tire comprising a plurality of circumferential grooves having a width between 2 mm and 15 mm and a depth in the range of 11 mm to 18 mm."

[12] To the extent that Appellants are arguing that Adam is from nonanalogous art, we do not agree with such argument because Adam is directed to pneumatic tires and tire treads for large motor vehicles, which are in the same field of endeavor as Appellants' claimed invention. *Compare* Adam, col. 1, ll. 4–6, *with* Spec. ¶ 2.

7. Claims 9 and 16 under 35 U.S.C. § 103(a) based on Campbell, Campana, Adam, and Takigawa

Appellants appear to rely on the same arguments advanced in connection with the Examiner's 103(a) rejection of claims 1, 3–8, and 21–23 as unpatentable over the combined disclosures of Campbell, Campana, and Adam. *See* App. Br. 12. Appellants do not address the Examiner's § 103(a) rejection based on the collective teachings of Campbell, Campana, Adam, and Takigawa. *Compare* Final Act. 12, *with* App. Br. 12. Nor do Appellants address the teachings of Takigawa. App. Br. 12.

Accordingly, based on the same reasons stated *supra*, we affirm the Examiner's decision rejecting claims 7 and 16 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, Adam, and Takigawa.

8. Claim 17 under 35 U.S.C. § 103(a) based on Campbell, Campana, Adam, Takigawa, and Tire Design Guide

Appellants appear to rely on the same arguments advanced in connection with the Examiner's 103(a) rejection of claims 1, 3–8, and 21–23 as unpatentable over the combined disclosures of Campbell, Campana, and Adam. *See* App. Br. 12. Appellants do not address the Examiner's § 103(a) rejection based on the collective teachings of Campbell, Campana, Adam, Takigawa, and Tire Design Guide. *Compare* Final Act. 13, *with* App. Br. 12. Nor do Appellants address the teachings of Takigawa and Tire Design Guide. App. Br. 12.

Accordingly, based on the same reasons stated *supra*, we affirm the Examiner's decision rejecting claim 17 under 35 U.S.C. § 103(a) as unpatentable

over the combined disclosures of Campbell, Campana, Adam, Takigawa, and Tire Design Guide.

9. Claims 9, 15–17, and 19 under 35 U.S.C. § 103(a) based on Campbell, Campana, Adam, and Suzuki

Appellants appear to rely on the same arguments advanced in connection with the Examiner's 103(a) rejection of claims 1, 3–8, and 21–23 as unpatentable over the combined disclosures of Campbell, Campana, and Adam. *See* App. Br. 12. Appellants do not address the Examiner's § 103(a) rejection based on the collective teachings of Campbell, Campana, Adam, and Suzuki. *Compare* Final Act. 13–14, *with* App. Br. 12. Nor do Appellants address the teachings of Suzuki. App. Br. 12.

Accordingly, based on the same reasons stated *supra*, we affirm the Examiner's decision rejecting claims 9, 15–17, and 19 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Campbell, Campana, Adam, and Suzuki.

ORDER

In view of the foregoing, the decision of the Examiner to reject claims 1, 3–19, and 21–23 is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED